DRIVER

AUGUST 1985

THERE ARE NO ABSOLUTES
page 10

SOLO CRASHES
page14

A REAL 'BOMB'

SEE: SCOTCHING THE RUMORS
page 1

"I can hold my liquor" refers not to hanging onto the bottle, but to being able to function well under the influence. This claim is simply a boast and many who make it are irresponsible.

SCOTCHING THE RUMORS

"I drive better when I'm drunk." Don't believe it. *Nobody* functions as well when drunk as he does when sober.

There are many false ideas that surround the subject of drinking. We hope you don't believe any of them.

Drinkers and some kinds of sportsmen — fishermen, ex-high school football players and others — have a lot in common. They exaggerate their abilities, they like to brag about their exploits. The anglers, for instance, like to tell stories about the tough battle they had against some trout; the footballers like to relate how they made some "miracle" catch and went on to score. The drinkers take great pleasure in telling tales of how well they drove after a large volume of alcohol, managing to escape the notice of the police.

But whereas the sportsmen may be just full of hot air, the drinkers are full of something else: A liquid that causes them to believe a lot of what they say. Although the drinkers may have a lot of experience at drinking, they have very little real information on alcohol and its effects.

Consider this often-heard statement: "I drive *better* when I'm drunk." Some people really believe this, despite startling experiences. Here's an example.

WRONG WAY

A driver who often made that statement left a party with a friend in the early hours of the morning. Both men were very drunk. They decided to get on the road because home was about 60 miles away from the quiet town where they'd spent the last few hours, and they both had to work in the morning. They drove down a divided highway at around 70 mph for a mile or so without passing another car. It was one a.m. and most people in that rural area had gone to bed long before.

In the distance, they saw headlights approaching — in their lane. "Hey!" said the passenger. "They're coming right at us! We're on the wrong side of the highway!"

When they entered the divided highway the driver had mistaken an access road to their left for the northbound lanes. But *they* were in the northbound lanes, headed south. The driver steered to the left side — what was the right shoulder for the cars traveling in the proper direction — and stopped. When the two oncoming cars had passed he turned around, drove back to the nearest off ramp and got back on the right side of the highway. Then they continued toward home, without further trouble.

continued

DRIVER

Scotching The Rumors 1

There Are No Absolutes 10

The Solo Crash 14

Timely Topics 20

True Accidents 21

The Backyard Mechanic 22

Backfire 28

Safety Scramble Back Cover

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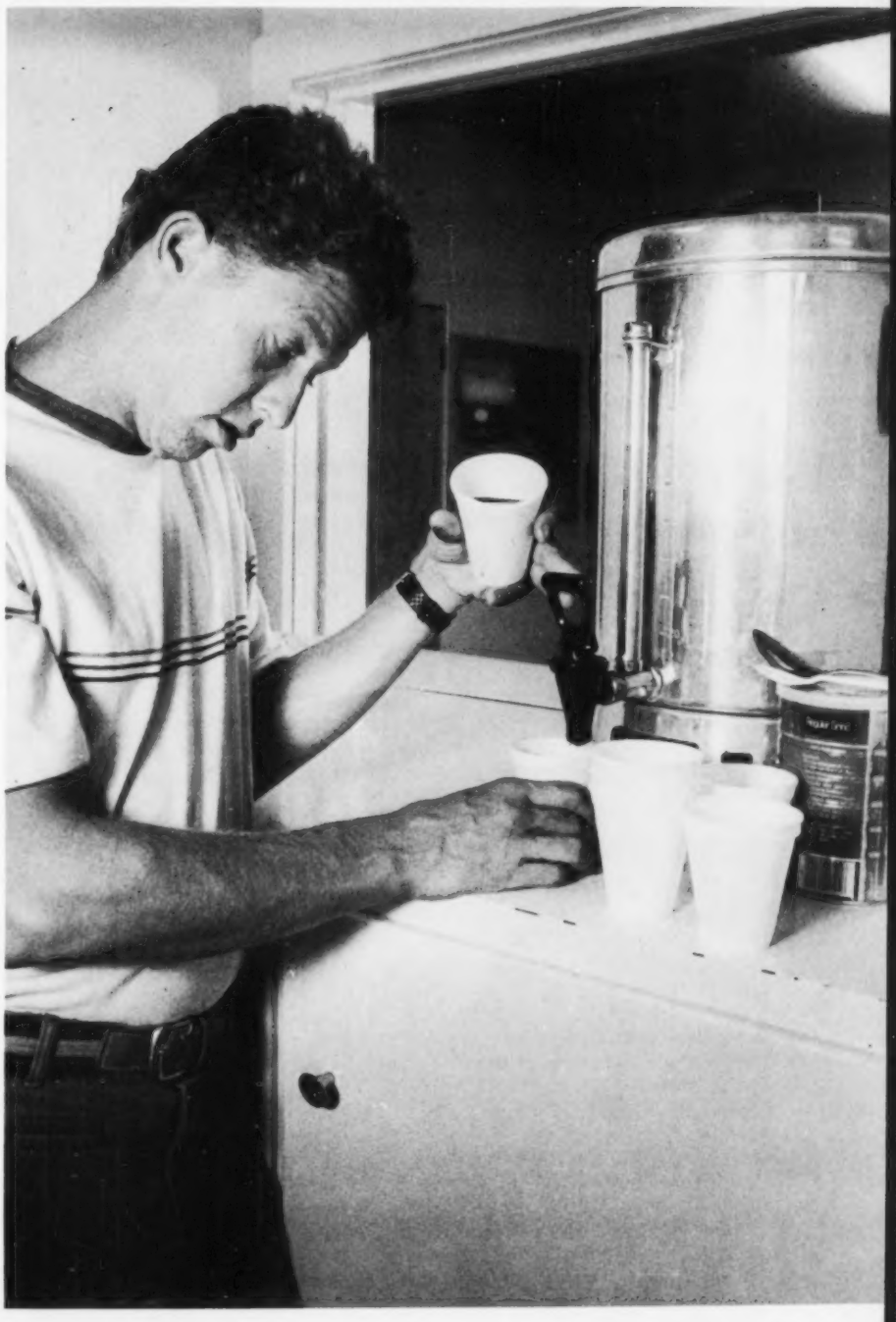
Coffee won't counteract the alcohol in your system, no matter how many cups you sip. Only time will sober you up.



So much for "driving better" under the influence of alcohol. They had been very fortunate to avoid a head-on collision with one of those cars.

They made several mistakes: One, drinking too much. Two, getting in the car in that condition. Three, entering the wrong side of the highway. Four, continuing, after they realized their mistake and corrected it. The fact they were able to arrive home in one piece was due as much to luck as to anything else.

LOWERED EFFICIENCY

But note the reaction of the driver to this near-disaster. He continued to believe that "I drive better when I'm drunk," and he continued to drink and drive. He thought only of the fact that "nothing happened," instead of thinking, as he should have, of what "might have happened" — a severe accident.

Foolish "macho" attitudes like that — "I can hold my liquor," "I drive better when I'm high," or "I don't feel a thing; I'm okay" — lead to accidents or, at the very least, to citations for drunk driving. Sooner or later it'll happen; it's only a matter of time. The fact is that any time you use alcohol — or any drug, for that matter — you lower your efficiency.

Lowered efficiency when you're driving equals accidents. Annually, over 50 percent of all fatal traffic accidents involve alcohol. During 1984, 69 Air Force people died in alcohol-related accidents. That is 47% of the 146 people who died in private motor vehicle accidents during that year.

With these statistics in mind, we're going to give you some facts about the way alcohol affects you. We'll also throw cold water on what may be some of your favorite misconceptions about drinking, "scotching some rumors," if you will. The reaction to these facts is up to you.

POURING IT IN

Alcohol affects everyone who uses it. Everyone. Some people may be able to consume a little more than others, and some may not show its effects as much, but all are affected.

continued

continued

Cold showers have their uses, we guess, but not to make a drunk sober. He will only become a wide-awake drunk, and probably pretty irritable.

How are people affected and what are the factors that determine how much they're affected?

Alcohol is rapidly digested into the bloodstream and acts quickly on your brain. First, alcohol affects your thinking and your judgment. (You usually think you are more sober than you really are.) Higher levels of alcohol in the blood will affect muscle control, and still higher levels will affect life functions, like breathing.

Authorities use the Blood Alcohol Level (BAL) or Blood Alcohol Content (BAC) to measure your degree of intoxication. BAL, or BAC, is simply the percentage of alcohol in your bloodstream. It takes very little, percentage-wise, to intoxicate you — only a tenth of a percent of alcohol in the bloodstream.

With a BAL of between .01 and .05 — that is, between one and five *hundredths* of one percent — you will suffer some loss of restraint and concentration. At BAL .05, your condition is "impaired." Between .05 and .10, your judgment is affected, as well as vision.

At BAL .10 coordination is affected and you are *legally* intoxicated. (In some places you're legally intoxicated at lower BAL.) We emphasize "legally" because you may be too affected to pilot a car at lower levels of blood alcohol, and accidents do happen to people at lower BAL than .10%.

By now you're wondering how long it takes to reach the level of legal intoxication. That will depend on several factors: The amount you drink, your body weight, whether your stomach is empty, and the length of time spent drinking.

Amount: The more you drink the drunker you get. That's obvious.

Body weight: The heavier you are, the longer it will take to become intoxicated.

Food: If your stomach is full, the food will slow the rate at which alcohol is absorbed into the blood.

Drinking rate: If you drink a lot of alcohol in a short time, you'll get drunk faster.

DRYING OUT

All of that may be obvious to you. You get drunk when you consume alcohol at a faster rate than your body can handle it. But here comes the catch, and it's a big one. Although you can, within limits, control the rate at which you become intoxicated — by slower drinking, eating beforehand, etc. — you cannot control the rate at which the body gets rid of the stuff.

Here's why. The process of getting the alcohol out of your system is handled almost entirely by your liver. The liver oxidizes — that is, burns off — 90 percent of the alcohol you put into your body. (The remaining 10 percent is expelled by sweat, breath and urine.) The Blood Alcohol Level drops only .015 percent per hour, no more.

This means if you're at BAL .10 and you stop drinking for three hours, your Blood Alcohol Level will drop to .055,

BAL CHART

After hours	1 Drink				2 Drinks				3 Drinks				4 Drinks			
	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
Weight pounds																
80	—	—	—	.02	—	—	.05	.08	.07	.10	.10	.10	.12	.12	.15	.15
100	—	—	—	.02	—	—	.04	.06	.05	.07	.08	.09	.09	.10	.12	.13
120	—	—	—	.02	—	—	.03	.04	.03	.04	.06	.08	.06	.08	.09	.11
140	—	—	—	.01	—	—	.02	.04	.02	.03	.05	.06	.04	.06	.08	.09
160	—	—	—	.01	—	—	.02	.03	.01	.02	.04	.05	.03	.04	.06	.08
180	—	—	—	.01	—	—	.01	.03	—	.02	.03	.04	.02	.04	.05	.07
200	—	—	—	—	—	—	.01	.02	—	.01	.03	.04	.01	.03	.04	.06

After hours	5 Drinks				6 Drinks				7 Drinks				8 Drinks			
	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
Weight pounds																
80	.17	.17	.19	.20	.19	.22	.22	.25	.25	.27	.27	.30	.29	.30	.32	.33
100	.13	.14	.16	.17	.16	.18	.19	.21	.20	.22	.23	.25	.24	.25	.27	.28
120	.09	.11	.13	.14	.13	.14	.16	.17	.15	.17	.19	.20	.19	.20	.22	.23
140	.07	.09	.10	.12	.10	.12	.13	.15	.13	.14	.16	.17	.15	.17	.18	.20
160	.06	.07	.09	.10	.08	.09	.11	.13	.10	.12	.13	.15	.13	.14	.16	.17
180	.04	.06	.07	.09	.06	.08	.09	.11	.09	.10	.12	.13	.11	.12	.14	.15
200	.03	.04	.06	.08	.05	.07	.08	.09	.07	.09	.10	.12	.09	.10	.12	.13

Numbers equal the percentage of alcohol in the blood. Dash (—) = a trace of alcohol.

Use this chart as a guide to tell you how much you can drink. The chart supposes that you've eaten, and are drinking an "average" drink. BALs for people with empty stomachs, and for those drinking more potent drinks (martinis, manhattans, "doubles," and the like) will be higher.

still in the "impaired" range. If you drank slowly enough to avoid raising the level above .015 in an hour, you wouldn't get drunk.

But that is very slow drinking indeed. For an idea of how fast people get drunk, see the table on page 5. Find your weight, and the number of drinks and you can see your Blood Alcohol Level. Such things as this table are general guides only, of course. Most people might fit into the mold, but some, for instance those with little tolerance for alcohol, will be affected much sooner.

FALSE IDEAS

Getting back to that process of removing the alcohol from your system, there are a lot of misconceptions about sobering up. We said we'd blow holes in a few myths, so this is as good a time as any.

Coffee. A good drink for a wake-me-up in the morning. A lot of people think the stuff will sober you up in a hurry. They are wrong. A drunk who downed a few cups of coffee would only become a wide-awake drunk, not sober. Of course, if he drank it for several hours he would sober up, but that is because of the *time* spent, not the coffee.

Coffee will not affect your liver's ability to eliminate alcohol from your system. Your liver will just plod along at the constant .015 rate. The same rule applies to things like exercise and cold showers. If you like them, great, but those methods will not sober you up any faster.

Let's go on with a few more myths. A lot of people will tell you "I know when I've had enough," or "I can handle my alcohol." They say these things when they're having difficulty standing upright, concentrating or focusing their eyes.

When you are drinking, your own judgment is a bad measure of your ability to drive safely, because one of the first things alcohol will affect is your judgment. You may feel in control but be prone to accidents. We are not talking about "falling-down drunk." Your ability to drive safely is affected long before you reach that stage.

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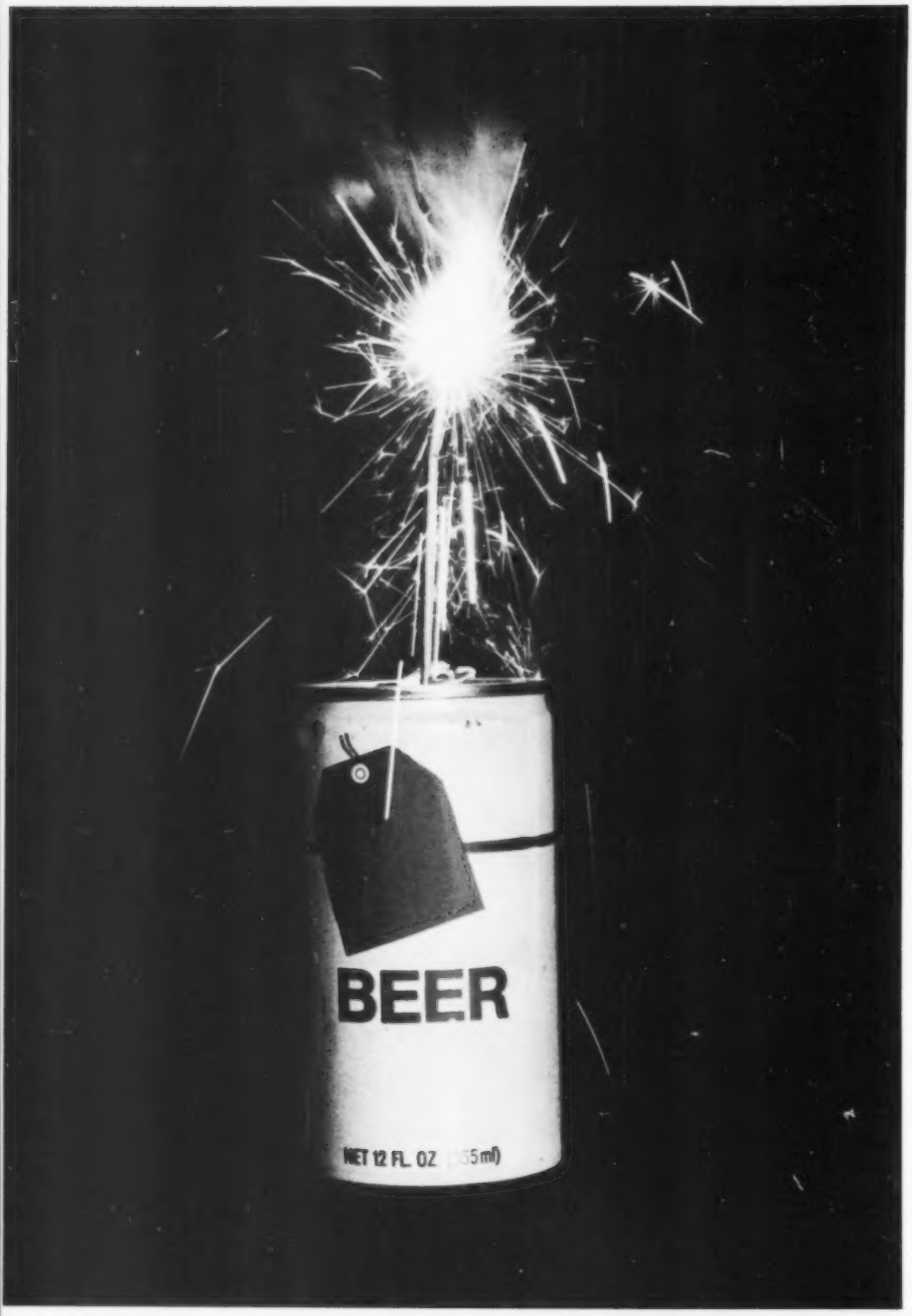


"It's only a beer." Many people believe that kind of statement, but beer and wine are potent forms of alcohol and should be treated as such.

"I drive better when I'm drunk." If our friend we mentioned earlier really *did*, imagine what he'd be like when he was sober! Again, alcohol affects your judgment, so you think you're driving better. Because alcohol relaxes them people think they drive better, but it also slows reaction times and impairs coordination.

Here are a few general myths: "Alcohol is a stimulant." We've seen a lot of people who've "stimulated" themselves right to sleep on the stuff, so we don't believe that one, either. Alcohol breaks down inhibitions and therefore *appears* to stimulate, but it is really a depressant.

"You get less drunk on wine or beer than on hard liquor." The proof of beer and wine may be lower, but it's still alcohol. It'll just take a little longer on beer or wine.

"Changing drinks will make you more drunk, and more likely to have a hangover." What'll make you more drunk and more likely to be hung over is drinking too much, no matter what you drink.

FIFTY PERCENT

We think you get the idea. There is more misinformation flying around about alcohol than real facts. Our purpose is to tell you of the dangers of drinking and driving. As we said earlier, studies consistently show that alcohol is a factor in at least half the fatal auto accidents, nationwide, every year.

And the dangers are especially strong for younger drivers. A 1983 study by the California Highway Patrol revealed that in fatal accidents the CHP handled, 32.4% of the drivers had been drinking. Broken down by age, in the 15 to 20 year old group, 33.5% (about a third) had been drinking; in the 21 to 24 group, 45.9% (almost half) had been drinking; and in the 25 to 29 age-group, 39.7% (well over a third) had been drinking. For the over 30s, the percentage dropped steadily with age.

What these figures mean is less important to us than helping you drive your car safely. So before we leave this subject, we'll give you some hints on how to avoid getting drunk in the first place, and what to do if you have a little too much.

Say you're going to a party where there will be drinking. If you go with friends,

(top)
Changing drinks has little effect on how drunk one becomes. It is the *amount* one drinks that determines his condition.

(right)
"I don't feel a thing." The speaker usually means he doesn't feel the effects of the alcohol and is okay to drive. In fact, after enough alcohol you really don't feel a thing, including pain.

the best method is to designate one person as the driver. He should drink soft drinks or straight orange juice and therefore be in shape to drive.

If you're going by yourself, *you* might consider not drinking. Some people don't like to see a person not drinking at a party, sure. But that's their problem, not yours.

RULES

But if you are going to drink, there are some rules you should stick to, to control the drinking and insure your ability to drive. First, eat something beforehand, or eat along with the drinking. Alcohol is not absorbed so quickly into the bloodstream with food in the stomach.

continued page 9

DUNGEONS

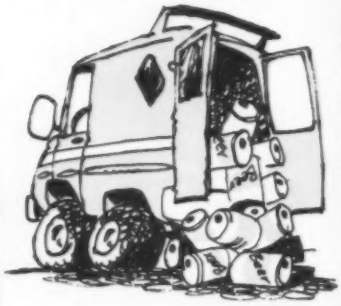
"Lessee here . . . 'The flagon in the wagon has the potion of commotion . . .' "

Considering the myths that go with drinking and driving, we thought it was appropriate to devote a fantasy role-playing game to it, based on a well-known game of this type.

In this, as in all role-playing games, you choose whatever character you like, and set him or her up with amounts of *strength, agility, intelligence,* and all the other attributes for the game, based on rolls of the dice. Your characters are:

"ROBIN STEWED AND HIS VERY MERRY MEN"
Robin Stewed
Alan-A-Gallon
Liter John
Maid Moonshine
Friar Tanked
Will Scarletnose

"No, no, it's 'The can in the van has the brew that will stew . . .' "



and

READ ON.

These characters are outlaws and thieves. They steal beer from the wealthy, give it to the poor and the sober, and they poach liquor from the King's winecellars and drink it themselves.

But the catch in DUNGEONS AND WAGONS is that you must roll a number for an amount of *drunkenness* that your character is to suffer. The higher the number, the more likely the drunkenness will cancel out all the good scores you get on everything else — *quick reflexes, good judgment, balance* — no matter how good these scores might be.

In all role-playing games there is a "Gamesmaster" or "Dungeonmaster," a man in charge. In this game, the dungeonmaster is called the SHERIFF OF ROTTINJAIL. He is looking for "violations" of any kind, especially that of driving while drunk.

The object of this game is to get your characters out of the castle and to the safety of SureGood Forest, past the Sheriff and his men. If you haven't guessed it by now, the drunkenness score gives the Sheriff of Rottinjail all the advantage he needs to take you out of the game.

"I think it's 'The cup in the coupe has . . .' "

WAGONS

"How 'bout 'The six-pack in the pick-up . . .' "

Second, drink slowly, and don't try to keep up with someone else. Remember what we said about the body's ability to handle alcohol — .015 BAL per hour. That will probably equal about one drink per hour, or even less, depending on your weight and the strength of what you're drinking.

Keep that strength in mind — a double hits a lot harder. Remember that alcohol mixed with a carbonated soft drink may affect you quicker.

Set a definite limit on the amount you'll consume, *before* you start to drink. Your judgment will be affected by the alcohol, as we said, and you may have trouble knowing when you've had enough. Stick with the limit, or below it.

When you stop drinking, allow yourself time for the body to rid itself of the alcohol before you leave. Remember, although .10 BAL is "intoxicated" and .05 is "impaired," lower levels of alcohol can reduce your ability enough to cause an accident.

If you suspect you've had too much, wait a while and stay where you are; perhaps even spend the night. Or have someone else drive you home, if they're in the proper condition. Don't assume a lack of any signs of drunkenness means you're okay. The weight chart is a better measure.

Besides your tolerance for alcohol (generally determined by your body weight) and your experience with drinking, there are other factors that will determine how alcohol affects you. For instance, if your mood is low, or if you're very tired, it's a bad time to drink.

If you see a friend having too much while you're sober, protect him by convincing him he shouldn't drive. That may not be easy, but it's worth the effort. Convince him to stay until he's sober enough to drive safely, or offer to take him home yourself. That's being responsible.

A wise and responsible driver knows he doesn't drive as well when he's been drinking, that there is no advantage in "holding his liquor." He drives only when he can do so safely, not when he's so drunk he gets on the wrong side of the highway.

"Alcohol is a stimulant." Considering how easy it is to fall asleep after a couple of drinks, can anyone really believe this one?

There are NO absolutes

Despite rumors to the contrary, there is no one place on the road where it is best to ride. When it comes to motorcycle lane positioning, there are no absolutes. Similarly, riding in the center of a lane isn't as much of a hazard as some people would have you believe.

Lane positioning is a fluid situation that is constantly changing. It changes with traffic. It changes as road conditions alter. It changes as your speed waxes and wanes. It changes with weather. It's always changing.

Ideally, when you're riding you want to have as many options open to you as possible. One of the best ways to do this is to split the difference in what's available. Centering your machine gives you an equal chance to go in either direction. But, because of the many factors involved in motorcycling, the center of the lane is not where you are normally going to be riding.

And regardless of where you choose to ride, you don't want to get locked-in where you can go in only one direction. For example, if you run close to a guardrail you are only going to be able to turn away from it. The same is true if you ride next to the curb.

When riding a motorcycle you should think of each lane as being divided into three equal sections: left, center and right thirds. You will normally ride in either the left or right third just about where they meet the center third. In other words, on either the right side of the left third or the left side of the right third.

These two positions afford you the best overall view of traffic and allow traffic the best look at you.

On two-lane roads with traffic traveling in both directions you will generally ride in the left third of the lane just about where the left and center thirds meet (figure 1). This should put you on the left wheel track of car traffic. In addition to being able to see and be seen from this position, you've placed your bike to avoid pot holes and other road junk.

Now, when you meet a truck coming the other way, you're going to want to move to the center third because of the larger vehicle's wake.

Traffic that may cross or enter your lane changes all of this. Regardless of where this traffic is coming from, the first thing you want to do is make sure they see you. Then you want to prepare for their possible actions.

To be seen by traffic coming from the right you move to the left side of the right third of the lane (figure 2). If the traffic is going to attempt to turn left in front of you, you move from the right to left side of the left third. This leaves you hugging the road's centerline (figure 3).

These first moves are especially important if you're in a flow of cars and trucks. In your normal left third position (where it meets the center third) you may be hidden from the other driver's view by the vehicle in front of you. If this is the case, the other driver could commit him or herself to filling the position in the traffic that you're already in.

For an extra measure of safety in either case, you may want to flash your headlight to help the other driver recognize you.

Then as you approach where you will actually face the other traffic, move to the center third next to the

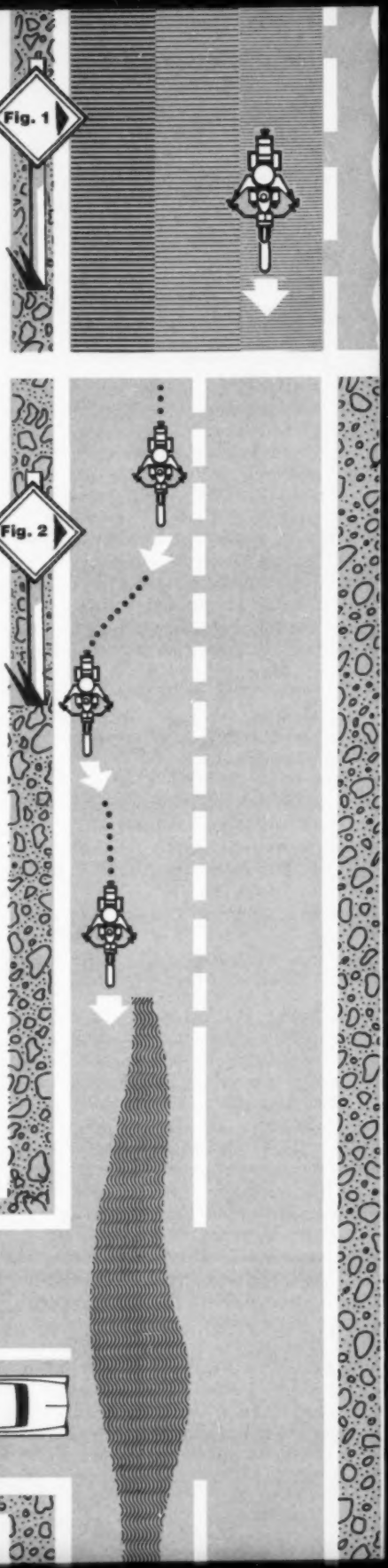


Fig. 1
The ideal two-lane riding position is in the left third of the lane just about where the left and center thirds meet.

Fig. 2
To be seen by traffic coming from the right you move to the left side of the right third of the lane, than back to the center third next to the oil/water track.

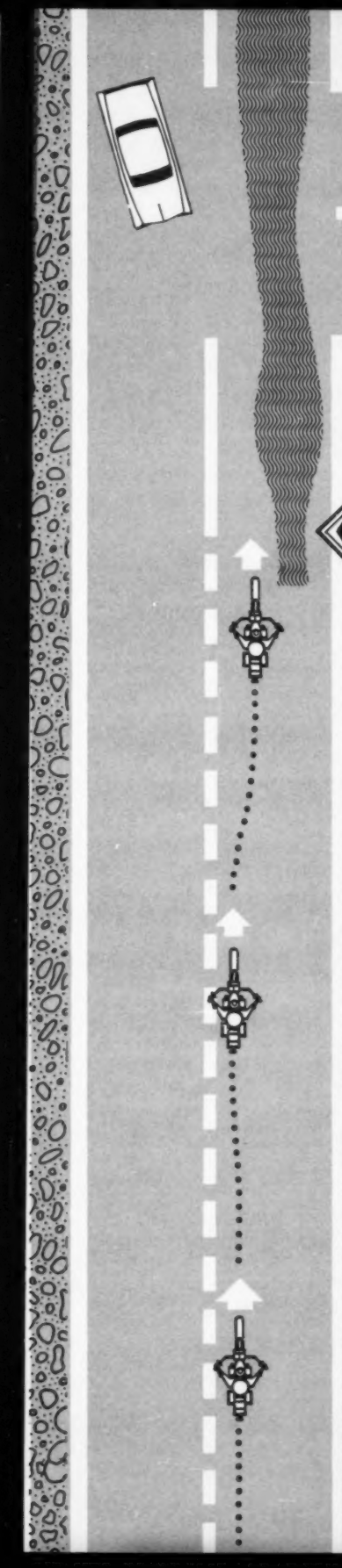


Fig. 3
To be seen by traffic crossing your path from the left you move from the right to left side of the left third, then back to the center third next to the oil/water track.

Fig. 3

oil/water track left by cars and trucks (figures 2 & 3).

It doesn't really matter if you're on the left or right side of this track. However, if time and room permit, you'll probably opt for the right side of the oil/water track. What you don't want is to actually be on that track within 100 to 175 feet of an intersection. It is within these distances that this track actually becomes slippery and can cause you control problems.

Now that you're in the center third you have room to maneuver either to the right or to the left depending on what the other driver does. Of course, you are going to want to slow down.

The reason for getting to the right side of the oil/water track if at all possible is that going left to avoid an accident is a last resort. If you have to go left to avoid a collision and you don't get your bike back to a straight path, you're going to be heading into oncoming traffic. It is better to T-bone a turning car or hit it a glancing blow at 25 mph then to hit another car head-on at a combined speed of 50 mph or greater.

Now there's going to be an argument about having to cross the oil/water track in an emergency maneuver if you select the wrong side of the track to begin with. For example, if you're on the left side of the track and have to go right to avoid an accident, you'll cross the oil and water.

This is where being in the center third as close as possible to the track helps. The angle of crossing the track will be less and, as a result, the effect of the oil and water will be less. If you had to cross the track from the greater angle while coming from the left third, the bike would probably be leaning well over and/or under heavy braking when it hit the slick track and would be far more likely to go completely out of control.

Four-lane roads, divided highways and freeways present a slightly different approach to positioning. In most cases you're going to want to get in the lane furthest to the left (figure 4). Yes, the traffic in that lane is usually going faster than the rest, but

continued

Riding in the left third of the lane just about where it and the center third meets provides you the best overall view of traffic and allows traffic to see you.

Running in the right third next to the center third of a multilane highway's left lane is the best way to see and be seen.

(top, above)
Having changed position to be seen by traffic that might cross your path, you move to the center third next to the oil/water track to give yourself an equal chance of going right or left to avoid an accident.

To change lanes on a freeway you simply move over one-third lane.

(left)
You want to control your lane up to the point of actually exiting by staying as close to or in the center third of the lane.

the left lane leaves you more flexibility. In the left lane you'll have to deal only with people moving into your lane from the right. In the right lanes you have traffic coming at you from the right and left as well as the trucks that live in the right lane.

When running the left lane in multi-lane situations you'll want to be in the right third (next to the center third). This way you can see, and the traffic in front of and behind you can see you. This lane position also gives you the option of moving right quickly.

When you're coming up on a truck, move away from it. Get to the left. This will help you deal with the truck's wake. It also allows you emergency maneuvering room in case something falls off or is kicked up by the truck.

Being on the left side of the right third of the farthest left lane also permits easier, move visible lane changes. You simply move over one-third lane and you're in the best position for right lanes: the right side of the left third (figure 4).

When exiting a freeway you want to control your lane up until the point you actually leave the super slab. To do this you stay close to or in the center third (figure 5). This keeps other traffic from crowding into your lane while you're still there. Especially traffic attempting to take the same exit.

There are a few occasions when you may have to run in the center third of a lane for a prolonged time. One is when you have traffic on both sides of you. In this case you have to stay toward the center. However, you occasionally want to weave to the left and right edges of the center third just to make sure the traffic on both sides of you remembers that you are there. And you'll also want to correct this situation by getting out from between the other vehicles.

continued

Another center-third running situation crops up when fighting gusty winds. The center-third position gives you an even shot when pushed left by the wind and then pulled right when the gust stops.

If you increase your following distance from the minimum two seconds to three or four seconds you may know a little more about when the gusts are going to hit from the way the cars are pushed around in front of you. But you still won't know exactly how hard they're going to hit you. Besides, you can't adjust totally for each blast; you're going to get pushed some by each gust. The increased following distance also helps you keep an eye out for flying junk kicked up by the wind.

Winds coming from the left can also be complicated by oncoming traffic which breaks the blasts into gusts. This is just like the problems created by buildings and large groups of trees.

Mountain roads present another situation which may require prolonged use of the center third of the lane. If you were to hug the inside of the lane — next to the mountain wall — you might find yourself on rocks, sand and other debris from above.

On the other hand, if you hang close to the outside of the lane, you might cross the centerline into oncoming traffic. Or the oncoming traffic might cross the centerline just enough to clip you.

Mountain roads may require prolonged use of the center third of the lane.

And if you play Ronnie-Roadracer and go from one side of your lane to the other, you most certainly are going to bite the bullet going around one of the corners. If the road debris doesn't get you, crossing the centerline will. In fact, the Ronnie-Roadracers often keep their tires on their side of the centerline, but the extreme lean of their bikes puts most of their body into the oncoming traffic lane.

Being in the center third doesn't guarantee you against finding rocks, sand, debris, oil or other traffic in your path, but it does give you a third of a lane on either side for manuvering room.

Of course, the best bet is to slow down. You never know what you're going to find when you round a turn. Somebody might have blown an engine or broken a brake line or the side of the hill might have come down. As a result the entire road could be covered with oil and water or brake fluid or rocks or . . .

If it is or has been raining you'll want to slow way down. In the mountains, rain can bring down the whole works: rocks, sand, trees, etc. And there are always the problems associated with free-standing water: mainly hydroplaning.

Whether on mountain roads, freeways or city streets, the motorcycle rider must play "what-if" with every car and traffic situation. "What if he turns left in front of me?" "What if she doesn't stop?" "What if there are rocks just around this corner?"

By doing this, you as the rider pre-program yourself to practice handling each hazard. Then when it really does happen your reaction times are reduced.

Because the motorcycling environment is in a constant state of flux, lane positioning has to be fluid and be adjusted for every change. As a result there is no one place that is best and there are no absolutes.

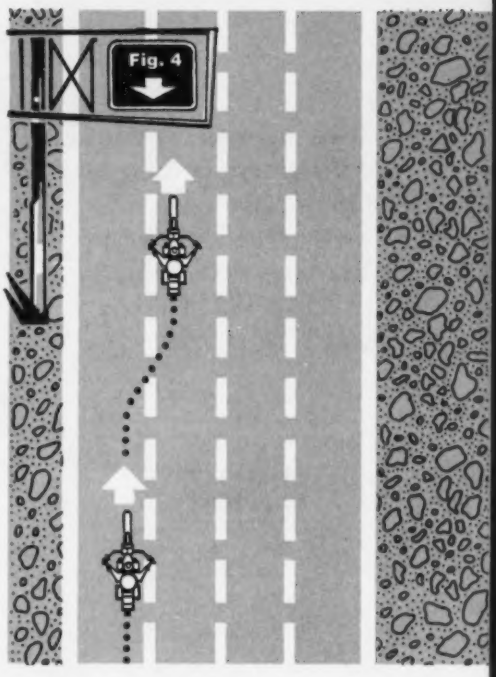


Fig. 4
The best place to ride in multi-lane situations such as freeways is in the lane furthest to the left. You'll want to be on the left side of the right third. To change lanes you simply move to the right side of the left third of the adjacent lane.

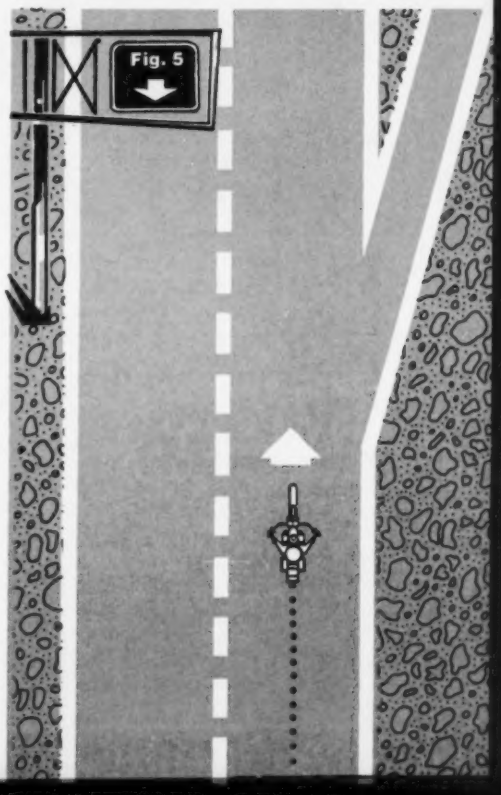


Fig. 5
To keep other traffic from crowding into your lane when exiting a freeway, stay close to or in the center third.

The single vehicle accident is largely the fault of you, the driver. So the solution is also within your control.

THE SOLO Crash

A sergeant was finishing up a three-day weekend at home with his parents. Late in the evening, with no sleep, he left to visit some friends in town. While there, he fell asleep. A friend suggested he sleep before driving the 375 miles back to his base, but he left anyway because he had to be on duty at 0700 the next morning.

About 35 miles from his goal, he fell asleep at the wheel of his car. A witness saw him slumped in the car as he drifted from the right side of the highway to the left and off onto the center median. He apparently awakened and tried to get back on the highway. But he overcorrected and went clear across the highway, leaving the pavement on the right side.

The car overturned and rolled two and a half times. The sergeant, not wearing his seat belt, was thrown out the open driver's window and pinned underneath the car. He died of a broken neck.

This is just one example of a type of accident that occurs thousands of times each year, but which receives less attention than the more spectacular mishaps. It is the single vehicle accident.

We are all aware of accidents involving other vehicles. (At least we should be. "Looking out for the other guy" could be a life-saving pastime.) But the single vehicle accidents can occur without the interference of other vehicles, sometimes when there are no other vehicles in sight.

Single vehicle accidents are really needless. Streets and highways are designed and constructed so that a prudent, safe driver shouldn't have any difficulty. However, many drivers are not prudent and safe.

In the true story that started this article, the driver made a mistake — he overextended himself. He drove a long distance without proper rest and he died in an automobile crash. The main cause was falling asleep at the wheel, but even though he fell asleep he might not have had the accident if he hadn't overcorrected. Further, even though he had the accident he might not have died if he'd worn his belt.

In single vehicle accidents, far more often than not, the primary cause is some mistake of the driver — driving too fast on a curve, driving under the influence of alcohol, and the like. Other factors often contribute, but the driver's mistake is foremost. And since the driver is at fault, these accidents should be all the more preventable.

We intend to deal with a few of the reasons for solo accidents, some of the factors and circumstances surrounding them, and what can be done by individual drivers to keep their cars on the road instead of against a tree.

HOW BAD A PROBLEM?

The National Safety Council breaks the single vehicle accident category into two groups, the non-collision accident (including rollovers and running off the road) and the fixed object accident. Together, these make up 36 to 37 percent of the motor vehicle fatalities each year in the U.S., only slightly less than the multi-vehicle accidents. Some sources report the percentage of single vehicle accidents much higher, and increasing each year.

Let's take a look at the Air Force experience. In 1983 there were 170 fatali-

ties in private motor vehicle (PMV) accidents. Eighty-two of these were single vehicle accidents. That's 48 percent. In 1984, out of 151 fatal PVM accidents, 83 were single vehicle accidents. That's 55 percent, over half.

TIME AND ALCOHOL

It is interesting to note when these accidents happen. Accident studies have shown that single vehicle accidents tend to happen on weekends, as opposed to multi-vehicle mishaps, which are more evenly distributed throughout the week. The one vehicle accidents happen more often in the late night hours, whereas multi-vehicle accidents occur more frequently during the evening drive home from work.

It doesn't take much imagination to make a connection between time and a degree of impairment. The example at the beginning of this article involving fatigue and those that follow involving alcohol show what we mean.

Alcohol is commonly involved in well over half the single vehicle accidents according to some studies. An item from the Mothers Against Drunk Drivers states, "Of those who die in single-car wrecks, 65 percent are drunk." The Air Force statistics for the past couple of years: 54 percent of the single vehicle accidents in 1983 involved alcohol, and 61 percent of the 1984 one-car accidents.

Sometimes the circumstances can be bizarre and frightening.

A sergeant was released from duty for a night shift and went to a bar and then to an off-base party. At both places he drank beer. After several hours he decided to go home. His friends were concerned and asked if he was sober enough to drive. He insisted he was okay and left.

The guard at the gate smelled alcohol, but let him go. He went through the base and continued on a highway at a high rate of speed, perhaps 55 or 65 mph. On a slight right curve, he came upon a stopped vehicle. He braked and veered to miss the other car. His vehicle skidded 122 feet before striking the center median and becoming airborne. It crashed into a tree in the median.

The sergeant suffered a severe head injury and died the next day.

Another example:

After working most of a duty day, an airman met some friends at a bar for a few beers. He drank for about four hours and then left with a friend to go to another bar. Witnesses at the second bar said they looked very intoxicated. They drank for about two and a half hours. During this time, they both got into arguments with others in the bar, and the driver was knocked down once.

After this, they went to a third bar where a friend noticed their staggering and slurred speech. They each had at least one more beer. The friend insisted he should drive them home, but they left before he could make arrangements.

They were driving along a highway at a high rate of speed when they ran off the right side of the road, taking out a roadside marker post. They were traveling so fast that as they continued on they knocked over three trees, each four to eight inches in diameter.

The car finally came to rest lying on the passenger side with the roof against a tree. The passenger was dead at the scene, and the driver was seriously injured. The two had to be cut out of the vehicle.

Investigators found that the car had been in excellent condition. There were

continued

no skid marks to indicate any braking. The investigators concluded the driver must have lost consciousness before running off the road.

And one more:

Four airmen met together after they got off work after 11 p.m. They spent about three hours drinking beer and then left the base to go to a lake. The driver parked his car pointed directly at the lake.

All four men went to the lake, but the driver soon returned and got in his car and went to sleep. When the others came back later they awakened the driver. He started his car and, apparently disoriented, drove directly into the lake. The car completely submerged.

The three passengers got out of the car through the right passenger window and swam for the shore. One of them drowned before reaching the shore. The driver was later found dead in his car. His blood alcohol level was .15.

Impairment from alcohol leads to other difficulties and mistakes. In the first alcohol-related example, the driver was not only drunk he was also speeding. Probably his reaction time was slowed, and the combination was too much.

In the second example, the drunkenness probably caused a loss of consciousness. Again, the driver was speeding.

In the third, the drunkenness caused the driver to make the mistake of driving into the lake, rather than away from it.

The solution: Don't drink and drive. It's that simple. You can't expect to drive safely under the influence of alcohol. Driving safely is usually a matter of skill, but after a few drinks it's a matter of luck. Your judgment is affected so you'll take more chances and go faster. Your reaction time is lengthened so you can't avoid hazards or react in time to emergency situations. Your perceptions are interfered with so all your senses are dulled.

Just don't do it.

SPEED

In the Air Force experience, as in the general population as well, speeding is often a factor in single vehicle accidents, but it is usually combined with alcohol. The examples that have already been cited will show this.

The solution: Don't speed. The speed limits posted on all roads are there for good reasons. Those on city streets will allow you time and space to stop safely at the next intersection and will allow you reaction time in case of the sudden appearance of other cars or pedestrians. The speed limits on winding roads will

FIXED OBJECTS

In a single vehicle accident, after the vehicle leaves the intended traffic lane of the road, it often collides with a fixed object.

The National Highway Traffic Safety Administration's Fatal Accident Reporting System shows that in 1980, the most common objects hit in fatal accidents were trees and shrubs. These accounted for 22.7 percent of all fixed object fatal accidents (on all kinds of roads).

On interstate highways and other limited access roads, the most common object hit in fatal crashes was the guardrail. The percentages were 41.8 and 29.4, respectfully, on those roads.

The most common object on other major arteries was the utility pole, with about 23.4 percent of the fatal mishaps.

allow you to navigate without leaving your own lane of travel. And so on.

Of course, you will notice, this says nothing about the problem of speeding mixed with alcohol. We have to go back to the previous solution: Don't drink and drive. When you've been drinking, your judgment is badly affected. You won't drive so slowly or so safely as you will when you're sober.

FATIGUE

Fatigue (even without the additional factor of alcohol) is often a problem in single vehicle accidents. The example that started this article points this out. But sometimes the driver can suffer fatigue even when he starts out rested.

A sergeant left base on terminal leave in conjunction with an honorable discharge. He was on his way to another Air Force base to visit a friend. He had had a full night's sleep and hadn't drunk any alcohol.

About eight and a half hours and 350 miles from his starting point, his car went off the left side of the highway and entered the median, which was flat and level. His car traveled almost parallel to the highway on the median for about 275 feet. When the driver tried to get the car back onto the roadway, it rolled over and did seven complete rolls. The driver was thrown out of the car and crushed when it rolled over him. He died in the hospital about two hours after the accident.

The investigating officer concluded the sergeant had fallen asleep at the wheel.

The solution: Don't drive when you're tired, especially for long distances. If you start out a long journey without proper rest, you can almost be assured of a loss of efficiency, followed by a loss of consciousness (and perhaps a loss of life). Driving long distances is boring at best, and the monotony of the drive can lull you to sleep easier than just about anything else.

But even when you start out rested, as in the previous example, there is a limit to the distance you can safely go. You must stop to rest regularly during the day, and you must stop early enough in the evening to allow some relaxation time *and* sleep time. (That means: Don't drive until you have to sleep and then sleep and go again. Even though you're only sitting, driving is a strenuous activity. Give yourself a break. Several breaks, in fact.)

Eight hours on the road, including all stops for food, gas, and even just stretching, is enough for one day. Think of it like you think of your job. After eight hours, you're ready to get out of there. Likewise, after eight hours on the road, look for a place to stop.

continued

INATTENTION

Carelessness and inattention to driving can also cause accidents. It takes a lot of attention to successfully pilot a motor vehicle, and just a slight lapse can lead to a crash.

A sergeant on a motorcycle was driving south on a road. He looked at something to his left and the momentary distraction caused him to lose control of the motorcycle. He went off the road on the left shoulder and continued 140 feet before he crashed into a telephone pole. Although he was wearing a helmet, he suffered fatal head injuries.

In this example, something took the driver's attention away from his driving just long enough and he lost his life. That may seem like a very out-of-the-ordinary example, but many single vehicle accidents are caused by slight inattention. Somebody just happened to see this one.

Only a momentary loss of attentiveness could cause you to drive out of your lane or off the road. Slight misjudgment or miscalculation, by itself, might not lead to a life-threatening accident but, on the other hand, it might.

The solution: Don't allow your attention to wander when you're at the wheel (or handlebars). Give all your attention and senses to the task of driving. Don't be distracted by advertising signs, sights, people or anything else that is not directly connected to effective driving.

IN CONTROL

So far, our solutions on avoiding the single vehicle accident have told you what you shouldn't do: Don't speed, don't drive drunk, don't drive tired, etc. Let us put the advice a different way: Drive within the speed limit, so you can maintain control. Drive sober, so your reflexes and perception will be good. Drive rested, so you can arrive safely. Drive alert, so you can see dangers before they surprise you.

You can avoid single vehicle mishaps, because you are in control.

Destructible barrels, filled with varying amounts of sand, can serve to slow a colliding vehicle to a survivable speed before it comes in contact with a concrete abutment.

These barrels have already absorbed some collision impact.

SIGNS, SIGNALS

As much as possible, roads are designed to be free from surprises for the driver. When surprises are possible, the highway builders have made provisions to enable drivers to navigate safely. These provisions are in the form of visual signs and markers and various kinds of barriers designed to alert the driver of the road ahead, or that the car is going out of its own space. In extreme cases, certain devices are there to keep it within that space.

Every sign on the road is designed to show where the driver needs to be. The signs showing the curves ahead, those showing the imminent narrowing of the road, and especially the reflector signs at the sides of the road, serve as guides for the driver.

The lines painted on the highways and streets also show where the automotive traffic should stay. The dotted lines between lanes and the solid lines between opposing traffic directions give the driver a guide to maneuver the car.

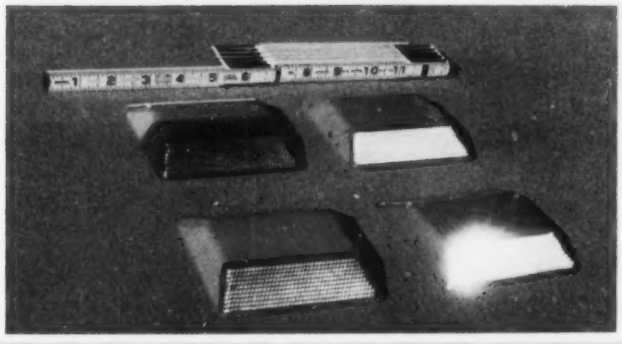
Beyond these, there are more involved methods of displaying the proper route of travel. In certain areas (California among them) raised markers are used along with the dotted lines between lanes. Some of these are beveled, with reflectors for nighttime driving. Other markers, in the form of rounded dots placed in a line, serve not only as a visual delineator of the lane but also as an audible signal — they cause the car tire to make a noise when it rolls over them.

Another audible "signal" that is used in some places is called the rumble strip.

These rounded dots are applied to the freeway to serve as a visual marker of the lane boundaries. If the car crosses them, they cause the tires to make noise and the driver also gets an audible message.

Some barriers are filled with water.

Reflective, beveled markers are one method used to mark the lanes.



AND BARRIERS

This is a series of grooves cut into the pavement *across* the direction of traffic on the shoulder of a highway to tell the driver the car is off the traveled portion of the road. These strips are sometimes used to show the end of a highway.

The physical barriers that are used on streets and highways are placed there to guard the driver from leaving his or her own lane or from hitting something. Hitting the barriers, of course, will cause some damage to the vehicle, but not so much as, for instance, running off into a ravine or hitting opposing traffic.

The most common barrier is the guardrail. Guardrails keep the car on the road where the surrounding area is lower than the road, such as in the mountains where they appear on the outside or curves, and on bridges where they are installed on both sides of the road.

Other common barriers are fences and bushes, placed to keep cars in place or slow them if they get out of the proper lane.

Cement barriers are often put between opposing lanes of traffic on freeways. These barriers will prevent the worst kind of two-vehicle accident, the head-on collision, if a car should go to the left. Since they are made of cement they can cause severe damage to the car, and they are therefore sloped to minimize the damage.

In some places, certain solid obstructions exist that present too great a danger to traffic. Bridge abutments, light poles and the like are examples of this. At such places, the highway department might install an impact attenuator. Impact attenuators are collapsible barriers that will slow and (hopefully) stop a vehicle before it hits the solid obstruction. There are different types of impact attenuators. Some will be containers filled with water, some with vermiculite, some with sand. Some will be surrounded by a guardrail. These barriers will, of course, damage the car, but again the damage will be far less than what would be caused by a single vehicle accident against what they stand in front of.

Our thanks to the California Department of Transportation (CALTRANS) for their help with this article.

Timely Topics

ALLEGED REAR BRAKE LOCKUP IN 1982-1984 GM A-CARS

The National Highway Traffic Safety Administration (NHTSA) has opened a formal safety defect investigation of alleged rear brake lockup in model year 1982-84 A-body cars manufactured by General Motors.

All of the vehicles are front-wheel drive models, which include the Chevrolet Celebrity, Pontiac 6000, Buick Century, and Oldsmobile Ciera. General Motors has reported it built 1.9 million 1982-84 A-cars.

The federal safety agency said that it is aware of 688 owner complaints involving 114 accidents and 44 injuries in these cars. The rear brakes allegedly lock during normal braking maneuvers, resulting in skidding that could lead to loss of control. Complaints indicate that the problem occurs primarily when roads are wet.

The decision to open a formal investigation is based on information gathered during a NHTSA engineering analysis begun in August 1984 on GM's A and J-cars. The agency has decided to exclude the J-cars from the formal investigation because almost all complaints to the agency involve the A-models.

Anyone who has experienced this problem or has information pertinent to the investigation is asked to report it in writing to NHTSA, Office of Defects Investigation, 400 Seventh St., SW, Washington, D.C. 20590, or call the agency's toll-free Auto Safety Hotline on 800-424-9393 (426-0123 in Washington, D.C., metropolitan area).

AUTO OWNERSHIP COSTS UP

The cost to own and operate a typical new domestic compact car climbed to a record 45.67 cents per mile in 1984, reports the Hertz Corporation in their annual auto expense survey. The 1984 figures topped the 1983 total of 43.28 cents per mile by 2.39 cents or 5.5 percent. Hertz said higher car prices and interest rates along with increases in insurance, license fees, taxes and maintenance offset any gains made in lower gasoline prices.

NEW BRAKE LIGHTS

The National Highway Traffic Safety Administration requires a high-mounted, rear brake light on all new cars sold in the United States after Sept. 1.

General Motors already has begun equipping its 1985 Cadillac De Villes and Fleetwoods with the lights as standard equipment. GM is also leading the way by offering the safety devices on several other models as an option.

The lights are already available to automobile owners who wish to install them on their own cars. Auto-parts, department and discount stores carry the lights in various colors. They are designed to be mounted inside the car on the rear-window deck.

They sell for about $20 to $25, depending on whether they are equipped with a special circuit that screens out the flashing turn signal. If you don't want to install the light yourself, any garage should do the work for a relatively small charge.

Eventually, auto makers will be designing the additional light into the rear ends of cars, but, for now, most of them will opt to simply mount the light in the rear window or on the trunk.

The highway safety administration believes that the new brake lights will be the most effective accident-prevention standard they have ever put in place. The agency began studying the lights in 1977 and has accumulated about 100 million test miles in highway and city driving conditions. The tests, which were conducted on taxis and telephone-company cars, showed that the lights reduced rear-end collisions by more than 50 percent.

One unanswered question about the effectiveness of the lights is whether they will prevent as many accidents when all cars are equipped with them. Possibly they are more effective in tests because they are still novel and thus attract greater driver attention.

Still, the lights are certainly far more visible than conventional brake lights, which sometimes are mounted below the normal line of vision of a following driver.

The third brake light may also be effective in preventing multiple rear-end collisions, because the light should be visible through the windows of cars up ahead. Thus, an alert driver may get advance warning that a car is entering a panic stop much sooner than before.

Z-CAR INQUIRY

Automotive News reports that NHTSA has upgraded its investigation into an alleged sudden acceleration problem in 1980-1985 Nissan 280-ZX and 300-ZX sports cars following reports of some 60 incidents in which the condition occurred.

In moving the inquiry from "preliminary investigation status" to an "engineering analysis," the safety agency has indicated that the possibility of a safety-related defect exists.

In California, a Nissan spokesman said the company had completed its own investigation and had notified NHTSA that it knows of no defect in the product that could cause the alleged condition.

Nissan has sold more than 300,000 of its Z-series models since 1980.

AUTO REPAIR SECOND OPINIONS

A significant number of Americans are seeking a second opinion before undertaking major automotive repairs. A survey of 398 consumers found that 60 percent of these car owners had paid a mechanic for a second opinion and 45 percent for a vehicle diagnosis. The poll, completed for Arrow Automotive Industries by an independent research firm, found consumers score job competency highest at independent auto repair garages, new car dealers, chain auto service centers and import car repair specialists. Harry A. Holzwasser, president of Arrow, said the study confirms, "emergency industry trends, such as paying for repair diagnosis or for preventative maintenance are the wave of the future."

FRONT WHEEL DRIVE TIRE ROTATION

Rotating tires on front wheel drive cars can help tires last longer, say tire experts at both vehicle and tire manufacturers. Since the front tires on front wheel drive vehicles carry the weight of the engine and transmission and are used for both steering and driving, they take extra wear and tear over tires on conventional rear drive automobiles. Car owners should check their owner's manuals for approved rotation patterns and intervals.

APOLOGY

AIC SETH MALGIERI
AFCC/PAD

should have been credited for the story and photos, "Another Life Saved," on page 21 of the May 1985 Driver. We regret the oversight.

TRUE ACCIDENTS

Following are a few reports of accidents involving Air Force members. We have removed names and references to dates and places.

FIVE IN ONE

Four airmen returned to their overseas dormitory at 2400 hours after spending three hours drinking beer in town. There, they drank more beer and were joined by another airman at 0030 hours. The five left with other friends to visit a local disco. They drove carefully to avoid the notice of the police, since they had all been drinking. At the disco, they drank and danced until it closed. They went to the car about 0400. The passengers said the driver appeared to walk normally. All five of them got into the driver's Volkswagen beetle. The driver and the front seat passenger wore seat belts and shoulder harnesses, but the three in the back seat did not. All the passengers apparently fell asleep almost immediately. The driver drove two miles before dozing off and allowing the car to drift across the centerline. When he awakened he braked and steered back to the right, but he overcorrected and caused the car to skid sideways for 100 feet. The car left the paved part of the roadway, hit a dirt bank and returned to the road 40 feet farther on. The car came to rest on its left side. The two passengers in the center and right of the back seat were ejected through the back window during the impact with the dirt bank. One of them suffered a compression fracture of the lower back and the other received cuts and broken ribs. The third back seat passenger, who was sitting where the car took the brunt of the impact, died from multiple injuries. The driver and the front seat passenger were not injured because they wore the belts. The driver's Blood Alcohol Level was .13.

LANE CHANGE

An airman was riding his motorcycle at 1605 hours. He was traveling south in the right lane of a highway, approaching an intersection. Ahead, a car was stopped at the intersection in the left lane, preparing to make a left turn as soon as the opposing traffic cleared. The airman moved into the left lane to pass a slower vehicle and then noticed the car stopped directly in front of him. He locked up the rear brake in the attempt to stop, but hit the rear of the car. He was thrown off the motorcycle, hitting a light pole in the median. He died at 1725 from massive internal injuries.

"T" INTERSECTION

A staff sergeant and his wife left their residence in their car at about 1145 hours. About a mile from home they came to a "T" intersection at the crest of a hill. A car moving in the opposite direction made a left turn as they reached the top of the hill and struck their car in the left front fender. The staff sergeant was dead at the scene. His wife and the driver of the other car were hospitalized. The sergeant had not worn his seat belt and shoulder harness.

PASS ON RIGHT

An airman was riding his motorcycle on a four-lane highway at about 1845 hours. He tried to pass a vehicle on the right. The motorcycle's front tire hit the curb and the cycle flipped and hit a telephone pole. The airman suffered multiple injuries and died in the hospital at about 2330 that evening. He had been traveling well over the 35 mph speed limit and had passed several cars before the accident.

SPEEDING . . . ALCOHOL?

An airman picked up a friend on his motorcycle at 0745 hours. After breakfast they went to a pool hall, where they played and drank beer for an hour and a half. From there, they went to a motorcycle shop where the owner did maintenance on his cycle. People have consumed alcohol at the shop, but it was not determined if the airmen did. About 1245 they left, in the passenger's words "to blow the motorcycle out." Both airmen were wearing helmets, gloves, boots, jackets and long pants. At 1305, they were traveling at high speed on a highway. They came to a sharp curve and the driver leaned the cycle hard over. The passenger became frightened and straightened up, causing the driver to lose control. The cycle left the road and traveled 167 feet on soft ground, jumped a driveway, hit a culvert 20 feet farther on, then flipped and rolled for another 27 feet. The passenger was thrown from the cycle when it hit the culvert; he traveled 77 feet farther and landed waist deep in a ditch filled with water and mud. The driver landed near the motorcycle, which was completely destroyed. Police officers reported a strong odor of alcohol on both men, but a Blood Alcohol Test was accomplished only after the driver had received blood transfusions, so an accurate measure was not possible. The driver had a compression fracture of the spine, broken left arm and internal injuries. The passenger suffered dislocated hips, fractured pelvis and partial castration. Both received permanent partial disabilities. An investigation showed the cycle owner had very limited experience before buying the 1000 cc motorcycle, his first cycle, four months before. He was scheduled to take the AF hands-on motorcycle course three days later, just two days after the accident.

DOG

A sergeant was returning to his overseas base with two airmen passengers at 2030 hours. He was taking one of the airmen to the base clinic for treatment of injuries received in a go-kart accident. The injured airman was buckled into his seat belt; the other airman and the driver were not. About a mile and a half south of the base gate, the driver swerved to the right to avoid hitting a dog. The car ran off the right side, then came back on the road. At this point the driver lost control and the car went off the left side of the road, hit a ditch and rolled two or three times. The driver was thrown out of the car and died at the scene. The passenger without the seat belt was also thrown out. He and the belted passenger were treated at the base clinic and released. The car had been traveling 10 kph over the posted limit for the road.

Answers to SCRAMBLE

1. TIRES
2. FENDER
3. VALVES
4. LUGNUT
5. BATTERY
6. STARTER
7. HEADLIGHTS

Safety phrase
SEAT BELTS SAVE LIVES

LIGHTS!

Headlights are important to the safe operation of your vehicle. Generally, new cars are delivered with the best possible lighting system that can be provided. However, all the engineering that went into providing illumination may be wasted if the system is not maintained properly.

We'll be bold in asking: Are all your lights working and properly aimed?

In a recent nationwide survey*, only 16 of 1,938 headlamps were found to be defective. Seven were not working, three had cracked lenses, three were improperly installed, two had condensation inside and one was missing. Therefore, following the National Traffic Safety Administration-contracted study figures, the odds are 99.1 to 100 that your lights are working.

In contrast, the study indicated that headlamp aiming is often very poor. About one in every three lamps checked was outside the Society of Automotive Engineers' specifications (plus or minus four inches at 25 feet) vertically. One in four were not aimed properly horizontally.

That's the bad news. The good news is that replacing automobile headlights is usually as simple as turning a screwdriver. Aiming them correctly is also relatively easy in most cases.

If you're buying a replacement headlight the first thing you have to know is which one to buy. It used to be easy, but the days of the one-size-fits-all headlamps are long gone.

To know which lamp to buy, you should first take a good, long look at the lights. They'll either be round, rectangular or blended into the slope of the front of your vehicle. Remember which. The best way to do this is to employ the latest technology in memory devices: pencil and paper, and write it down.

Now count the number of headlights on the vehicle. There should be either two or four (one or two to a side). If you get a number other than two or four you've counted something that isn't a headlight or your vehicle has an auxiliary lighting system. (A little hint here: Auxiliary lights are usually not built into the body of the vehicle, while headlights normally are built in. There are exceptions to this, but the people who buy the cars that are the exceptions usually know it to begin with.)

OK, pay close attention as I feel a quiz coming on.

If the headlights are round and there are a total of two, you'll need 7-inch replacement lamps. But if there are four round headlights, it is the 5¾-inch models that will be required.

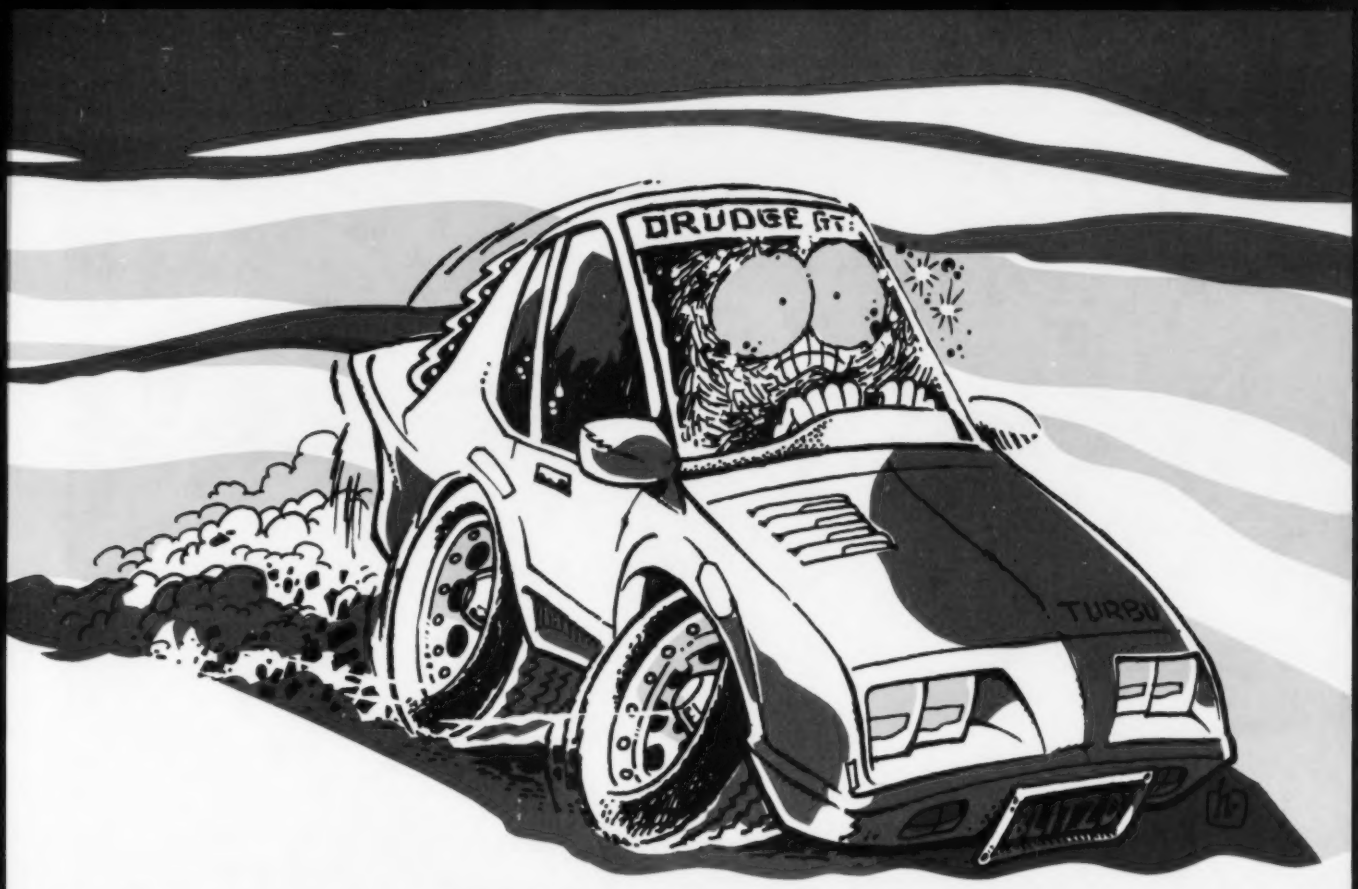
Should your vehicle have two rectangular lights, then you'll need 6- X 8-inch replacements (the actual measurements are about 5⅞-inch by 7⅞-inch). Four rectangular lights usually call for 4- X 6-inch replacements (actually closer to 4 inches by 6½-inches in actual size). However, there is a new 92- X 150-mm, four rectanglar light being used in 1986.

If that isn't confusing enough, within the past few years, lights that have lenses that blend into the slope of the vehicle's front-end design have come into accepted use. Of course these aerodynamically-blended lights should be replaced with exact duplicates.

With both the round and rectangular two-light systems, there is only one basic type of replacement lamp. However, the four-light models come in two types. One is a low/high beam, while the other is high beam only.

When attempting to figure out which you need, remember that usually the lights closest to the sides of the vehicle (or top, on some) are the combined low/highs, while the inside or lower lamps are highs only.

As you can see, buying the right replacement headlight isn't as easy a task



as it once was.

Now for the pop quiz (you were warned): A vehicle has four, round headlights. The left light, closest to the grille is burned out. What replacement lamp is required?

A. 6x8 regtangular
B. 7-inch round
C. 5¾-inch round low/high beam
D. 5¾-inch round high beam only
E. I respectfully refuse to answer that question on the grounds that it might tend to incriminate me.

The correct answer is "D". The quad-light systems use the smaller bulbs with the low/high beams mounted as far to the sides of the vehicle as possible, and the high-beam-only lights mounted inside or below the others.

"E" or taking the "fifth" is an acceptable answer if you qualified it with, "I'll ask a salesperson for help."

Whether you're replacing a burned out light, installing brighter halogen sealbeams or European-style headlamps, the steps to take out the old and put in the new are pretty much the same from one vehicle to another.

But before we get started, a few words about screws. Most automobiles are put together with Phillips head screws which allow machine assembly. The grooves in a Phillips head can become clogged with sand and dirt, making it difficult to get at. The more serious mechanics might consider replacing the Phillips head screws used for mounting and adjusting with slot head screws.

Additionally, almost all the screws in the headlight assemblies are exposed to road splash and are frequently rusted. It is wise to spray all these screws with rust-penetrating solvent before even thinking about turning them. And, whenever turning these screws, don't force them or you could ruin the mounting threads.

If your car has concealed headlights or units that pop up, you are going to have to find a way to keep the cover open or the assembly up while working on the lights. Most manuals will tell you how to accomplish this. If not, almost any mechanic, service manager or respectable parts counter sales person can provide such information over the telephone.

continued

Look for more cars to have specially designed headlights to fit their aerodynamics.

continued

However, sometimes it's easier to just remove the cover.

To get at the light itself, remove the headlight body molding. It is usually held in place by sheet metal screws. Once you've put the molding aside so that you don't step on it, remove the retaining ring screws and the retaining ring. Now all you have to do is carefully pull the headlight assembly out and unplug it from its wiring harness.

Plug the replacement light into the assembly and carefully push the unit back into the adjusting ring where the other lamp was removed. There are glass tabs on the replacement light that help position the lamp when properly aligned in the adjusting ring slots. Put the retaining ring over the bulb and install the attaching screws.

Another word of caution: Don't overtighten the retaining ring screws when installing quartz lights. The lead crystal lens of these lights get hot when operating and the stress from over-tightening can easily lead to cracking from vibrations or even cold water splashes.

At this time you have to decide if the molding allows access to the adjusting screws when it is in place. If not, leave it off until the headlights are aimed, otherwise put it back on. The same with the door or cover, if you removed it.

As few backyard mechanics are going to lay out $500 for a track-type aimer, headlight alignment will be limited to the portable aimer or casting shadows on a wall. Neighboring backyard mechanics with more than one car per family might pool their resources for a good $100 portable aimer. However, most of us will have to trek to the auto hobby shop to use one, or wait until dark and shine our lights on a barrier.

The individual behind the parts counter should be able to help you select the proper headlights for your vehicle.

The under-$10, vertical-only headlight adjusters are questionable buys. First, all you can adjust for is vertical alignment. Second, they're only accurate to plus or minus two inches at 25 feet which is half of the allowable tolerance.

A versatile device, the $100 portable system contains two aimers, with adapters for two- and four-lamp systems, round and rectangular headlights and floor slope measurement. You have to allow for the slope of the floor because adjusting your headlights while the vehicle is on a "hill" would mean that the lights would only be aimed properly for that hill. Which brings up another good point: Always have the tires properly inflated and at least half a tank of gas before attempting to aim the lights.

You start the aiming process by placing one of the aimers with floor slope measurement adapter beside the front wheel and the other beside the back wheel (on the same side of the vehicle, of course). Then level each adapter with the built-in bubble level and adjuster. Now look into one aimer turning the dial until the image from the other aimer is lined

Covers may make cars more streamlined, but working on these new 92 x 150 mm lights isn't made any easier because of them.

up. The dial reading is the slope of the floor. This reading is then programmed into the aimer to automatically compensate for the floor slope during alignment.

The aimers can now be attached to the headlights via a special suction cup arrangement. For vertical adjustment, turn the screws until the bubble is level. Horizontal adjustment is aided by a set of mirrors and a split-image focusing arrangement. When properly aligned, the reflected image from the opposite-side aimer split by the mirrors will be lined up.

There are ways of aiming headlights without all this fancy equipment — provided you have the time. First you'll need a level area about 50 feet long and a "screen." This level area will have to be easy to get to and easy to find reference points on. This will allow you to duplicate the set-up in the future. The screen can be anything — the garage door, a wall or a piece of plywood a few inches wider and taller than the front of your vehicle.

Ideally, you would first take the car to a professional for aiming. Then you will position the vehicle on your level area, square with the screen and mark on the screen the center of the beam patterns. If you don't want to mark up your garage door, you might position plywood or cardboard in front of it to act as the screen. It is also a good idea to mark on the back of the screen the exact position of the car in reference to the screen to make future duplication easier.

You'll develop a marking system that

continued

After insuring that the door will stay open, remove the headlight body molding to get at the lamp.

Having removed three screws, you can now remove the headlight retaining ring.

Pulling the lamp slowly from the housing, simply unplug it and plug in the replacement.

When pushing the bulb back into the housing be sure to align the tabs on the lamp with those on the housing.

continued

When installing European-style quartz lights be careful not to overtighten the retaining ring screws. The lead crystal lenses of these lights get hot and the stress from overtightened screws can easily crack them.

Raising or lowering the beam pattern is accomplished by turning the adjusting screw at the top of the assembly.

best suits you. But if you are looking for a place to start, why not mark the center of the low beams with an "L." Similarly, the centers of the high beams can be marked "H." When working with a four-lamp system, cover the low beams when marking for the highs. The reasoning is simple: If the low beams are aimed correctly, they'll also be correct when switched to high.

Now the next time you want to aim your lights, just duplicate the set-up and adjust the beams to your centering marks.

All this is done with the front of headlights 25 feet from the screen.

If you don't want to pay for a professional aiming you can still use the screen method. Most shop manuals will have the light pattern and measurements in them.

If such information isn't in your manual (or you don't have a manual) use these basic aligning instructions. On high beam at 25 feet in front of the car, the center of the light pattern should be at the same vertical height as the headlight centers and at the same horizontal distance between the headlights divided equally by the car's centerline. In other words, the brightest spot of the light beam should be directly in front of the headlamp and the same distance from the ground. See the diagram on page 27.

For those of you outside the continental United States here are some tips on aiming non-sealed beams. These tips are ideal "ballpark" aiming hints. You would be well advised to check with local officials regarding laws and regulations covering headlight aiming.

The H4 headlights (those with both low and high beams such as the 7-inch rounds) are aimed on low beam because the high beam function will more or less fall into place. Aim them ½-degree down and straight ahead. The half degree works out to about 2⅝-inch at 25 feet.

For those quad light vehicles that have H1 high beams, aim the high/low outside lights as with H4, because that is what they are. Aim the H1 inner beams parallel to the ground and straight ahead.

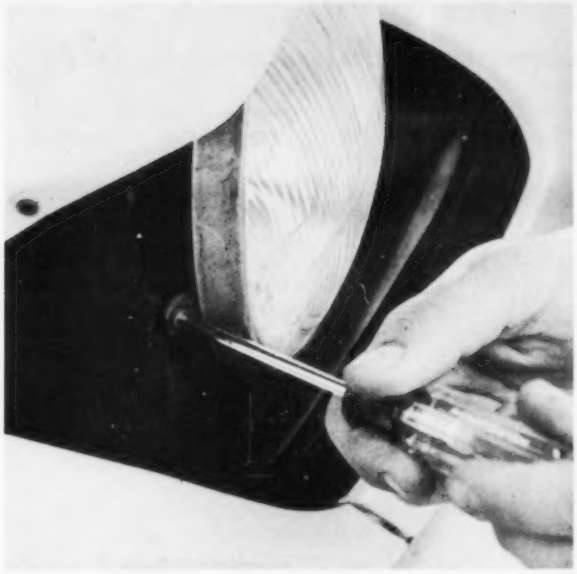
The screen may also be used for aiming auxiliary lights such as driving and fog lamps. Again, the aiming stated here is for "ideal" use; check with local authorities about the rules covering these units.

Driving lights used almost exclusively for long range should be aimed parallel to the ground and straight ahead. Driving lights used as cornering lamps should also be aimed parallel to the ground but 3 to 5 degrees left and right for the left and right lights, respectively. That's from 15¾ to 24½ inches off center at 25 feet. An alternative is to criss-cross the lights

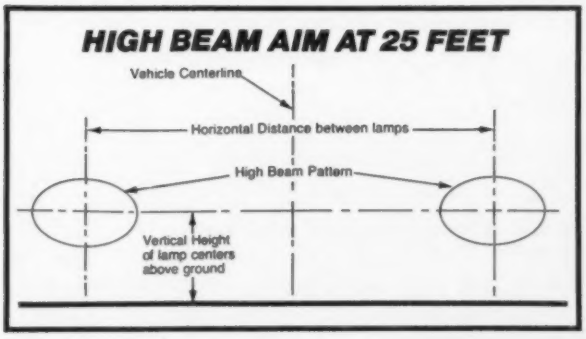
This halogen bulb is all that needs replacing in European, non-sealed beam headlight.

10 to 20 degrees. That works out to 52⅞ to 109⅛ inches at 25 feet.

Fog lights are another story. First of all, most states with laws regarding fog lights require that the "light beam (measured a maximum of 25 feet in front of and to left of center of vehicle) not be above a point 4 inches below the center of the fog light." If you can come up with a concrete aim from that, tell us. And that is also why we continue to advise check-



Horizontal alignment of the light is accomplished via adjusting this screw on the side of the assembly.


HIGH BEAM AIM AT 25 FEET
Vehicle Centerline
Horizontal Distance between lamps
High Beam Pattern
Vertical Height of lamp centers above ground

DIM-OR-I'LL-BLIND-YOU

Properly aimed headlights and auxiliary lamps do NOT give you the right to become a "dim-or-I'll-blind-you" enforcer. It is far better when faced with another motorist who refuses to dim his or her high beams that you seek the shadows of the road's edge than for both of you to be blinded.

As far as the laws go, most states require that driving lights be extinguished along with normal high beams within 500 feet of oncoming vehicles. Fines for not doing so are often higher than speeding penalties.

When faced with a driver who refuses to dim for you, slow down and avoid staring directly at the approaching lights. Guide yourself by keeping your eyes on the right edge of the road or the oildrip strip down the center of your lane. You may find it better to keep your eyes moving from the edge of the roadway back to the center of your lane, and then to a point somewhere in the oncoming car's lane. By doing this you may be able to drive a better course, see anything that might pop into your lane, and also spot potential hazards on his or her side of the street.

And a final plea for sanity: Never, never use high beams or driving lights as weapons against your fellow motorist, please.

ing with local law enforcement people.

For the best maximum foul weather effectiveness, aim fog lights ½-degree down and 0-3 degrees left and right. That's about 2⅝ inches below center and zero to 15¾ inches left and right at 25 feet. If, however, you're using your fog lights as cornering lamps, aim them parallel and 5 to 10 degrees left and right. That translates to 26¼ to 52⅞ inches left and right at 25 feet.

Again, all the aiming measurements given here are for ideal light use and not necessarily legal. Check with the local legal authorities.

*Society of Automotive Engineers Technical Paper 850229 by Paul L. Olson, head, Human Factors, The University of Michigan Transportation Research Institute

Properly aimed headlights not only make the driver feel better about being able to see, but prevent serious glare hazards to other drivers.

Backfire LETTERS TO THE EDITORS

DON'T TAKE A CHANCE WITH YOUR LIFE

For most of us, summer leave is meant to be a fun and relaxing time away from work. But often, if we aren't prepared, things don't work out the way we planned.

My mom and dad were going to vacation in Colorado and spend some time with my family. About a week before they were going to leave Mississippi, I flew home to spend some time with them and help them drive to Colorado Springs.

While I was home, I had several talks with my parents, especially my dad, about wearing seat belts. My dad has a job which requires him to drive about 50,000 miles a year. I worry about him a lot because the trips he makes are to the same cities over and over and driving conditions are mundane. I had reason to worry about him — he seldom wore his seat belt. He knew I always wore mine. My two little girls were always after granddad to wear his seat belt, and around us he did.

Finally, the time came to start on the 1,200-mile drive. My 6-year-old nephew was also included in our plans. The car was packed and ready to go and so was the small trailer we were going to pull. I had done all the safety checks during the week. Everything was going just fine. We left my parents' small farm expecting nothing but good weather and a safe trip.

About 30 miles from their house the weather changed. A light misty rain began to fall. The road was hot and steam was rising from the highway. As we left the city limits of a small town, we were still anticipating an exciting time in Colorado Springs where my wife and daughters were waiting. My dad was driving and I was in the front passenger seat. My mom and nephew were in the back. We all had seat belts on except my nephew, who was sitting in my mom's lap, surrounded by pillows and blankets. (That was a mistake we had made. When packing the car we put snacks, blankets and pillows on half of the back seat, covering two of the three seat belts.)

We were talking about getting a seat belt for my nephew when my dad noticed a log truck swerving in the eastbound lane. (We were westbound). The truck was obviously experiencing major difficulty. We began slowing as much as road conditions would allow. The truck started towards the ditch on our side, crossing our lane.

The right front of our car struck the cab of the truck just below the passenger door. The truck stopped our forward motion and drug us backwards into the ditch.

It's hard to say how fast each vehicle was going. Our car was severely damaged and the truck had little damage. What about us? Miraculously, no one was injured. The grace of God and our seat belts saved us. Because we had time to see it coming, the mistake of no seat belts for my nephew doesn't haunt us. However, it's a lesson that will never be forgotten.

The truck was cited for driving too fast for conditions. Regardless of fault, without the seat belts, there's no doubt serious injuries or death would have resulted from the accident. The time it takes to buckle up is worth it. Even though we were able to begin our trip again the next day, we wouldn't have been able to without seat belts.

Seat belts work. Just ask me — I know!

Capt. Carl D. Jones
USAF Academy CO 80840

FREEDOM OF CHOICE

Frankly, I am sick to death of all the 'freedom of choice' letters in your magazine and others in relation to seat belt use in cars and helmets, etc. on motorcycles.

Each and every American who has gone through high school should know that the freedoms this country was founded on did not include the 'Freedom to do any dang thing you want to, without regard to the rights and privileges of others.' They should also remember that 'Obedience to law is liberty;' the liberty which all members of the Armed Forces swear to uphold and protect at their swearing in process.

Those who cry foul over laws which seem solely to be aimed at their protection obviously have no idea that there are other reasons for protecting their bodies. The objectors do not understand that I, as a taxpayer, have a right to 'command' my legislator(s) to provide protection for my tax money in the best possible way. Providing laws against wasting tax money on the excessive use of publicly provided emergency police, fire and ambulance crews has been seen as effective by 'my' legislators. It is also my right to lead as peaceful a co-existance as possible with my fellow man and not be subjected to the gory sight of splattered brains and broken bodies littering my tax-money-built highways and byways.

Operating a motorcycle or automobile on the public ways might be likened to any game played for fun or profit. There are rules (laws) to be learned and followed as well as equipment to be acquired and used. Try catching a major league pitcher's fast ball without a glove, or running a football the length of the field against a major league team without proper gear and see how stupid you feel, not to mention how sore. Playing the game of travel on the roadways will take all the skill and equipment you can muster and you better know and observe the rules (laws) for taxes' sake as well as your body's.

The Armed Forces personnel give up many 'rights' when they volunteer to serve their country, such as being directly in control of their personal time. For this they are reasonably well compensated. They are also educated in various skills, which is expensive. This expense alone would be justification for the regulations which attempt to keep service members from harm. Add to this expense the fact that all service personnel, in some way, act as a team and the loss of one member of that team causes a breach of combat readiness. A new member must be found and trained to bring the unit up to combat strength.

These and many other reasons might be cited for using your seat belts and helmets, most of which have little or no bearing on your personal wish to survive the game of life.

Remember, service member or not; if you choose (freedom of choice) to operate a motor vehicle on the highways of 'my' country, you have chosen to play 'my' game by 'my' rules. Play it right and you save us both money; play it wrong and you might die.

Cecil V. Anderson
Fort Huachuca AZ

Backfire

LETTERS TO THE EDITORS

EVERYBODY PAYS WHEN WE DON'T PAY ATTENTION

Please take a few minutes and consider a plea from the wing safety office. We safety technicians are tasked with convincing people to take the necessary measures to insure their own safety and that of their co-workers, friends and families.

We hold briefings to inform individuals of all types of hazards such as drinking and driving, poison control, seat belts, holiday and summer safety and the list goes on. It seems, however, that we are not reaching a large part of our audience. We know you get tired of seeing us with our safety inspections, spot inspections, safety courses, and mandatory safety briefings.

You get turned off and tuned out on safety. It takes a tragic mishap to get your attention. But what good is safety to you if you are the mishap victim? Excuse time, now, right? Time to convince yourself that this type of mishap couldn't happen to you.

You are too smart, have all the required training or have done it this way for years. You can think of all kinds of reasons to explain why you are mishap-proof. This makes you a very exceptional individual but, given time, you may join the other 17 exceptional individuals we have listed on our reportable mishap board.

If you have the attitude, "It always happens to someone else, not me," then you are the most likely candidate to be the next mishap victim. It doesn't matter if we are talking about job safety, home safety, recreational safety or driving safety. It all applies and your ATTITUDE controls the degree of safety that you apply to yourself and others around you.

Please stop and consider the ones who love and need you. Think of the impressions and hardships a needless mishap places on your loved ones. As a favor to all of us who value the safety and health of all our comrades, let us pull together to change whatever it is that is costing us precious lives and causing needless suffering for everyone.

Safety is and can be habit forming, folks. Please give it your honest effort before it is too late and everybody has to pay. Evaluate your safety habits now and take positive steps to protect yourself and your family.

SSgt. James L. Banks, USAF
Blytheville AFB AK

FOUR INSTEAD OF TWO

In your June 1985 issue, page 18, the caption under the photograph in the lower left hand corner stated "NO MATTER WHOSE CAR YOU'RE DRIVING, THE TWO SECOND FOLLOWING RULE APPLIES." The inadequacy of that statement compelled me to write to you.

Four seconds is the minimum amount of time needed to stop a passenger car. The time lengthens with the weight, type and speed of the vehicle.

Safety professionals teach four seconds as the minimum, and instruct to add a second for rain, add a second for fog, etc., until a safe following distance is achieved.

Scott Bartels
Safety Supervisor, AT&T
Kansas City MO 64141

The two-second rule for following has been taught for a long while. There is no implication one can stop in that time but evasive action is possible. We like your four-second plus rule a lot but doubt such spacing can be maintained. The complaint we get from our readers is that even two seconds invites other traffic to move into the clear space.

STORAGE TIPS

Your article in the April 85 issue of Driver, titled "Storage Time" was very informative and enjoyable. However, I would like to point out two items that weren't covered and one discrepancy.

Regarding automobile storage, the first item that should be done is a thorough car wash. This should definitely be done on the undercarriage, wheel wells and if possible the engine and engine compartment, followed by a complete drying out. Rust doesn't take long in attacking metal, and if mud and other debris is not removed it causes a prime area for it to begin. A check of the undercoating at this time would allow you to recoat if necessary.

Second, whether the paint is marginal or the climate is temperate, you should always make sure you have a proper wax job done on the auto body. Paint also oxidizes or "dies" in sunlight due to ultraviolet radiation and prolonged exposure to sunlight. Without the minimum of a wax job, paint could at least become dull (the worst is an actual cracking and/or peeling of the paint which could cause surface rust). Those owners with new cars and/or new paint (complete or partial) should check with a reliable source as to when they can wax their paint. Different paints and different additives to paint can alter the "curing" time for each paint. Paint, although dry, still has many solvents still evaporating; waxing prematurely seals these solvents in and can result in shortened paint life, reduced resiliency, hardness and worst of all a dulled or even hazed appearance.

Lastly, the jack stand photograph on page 27 has a misleading caption. You *haven't* eased the strain on the shocks by jacking the vehicle by the axle and arms (just relocated the normal stress). If properly placed on the *frame* of the vehicle, the jack stands will then relieve the strain on the shocks. Care should be taken not to raise the vehicle too high such that the tires are off the pavement since this will result in overextending the shocks and allowing the steering assembly arms to reach their lower stop which could harm bushings at the pinion and linkages. The proper procedure is therefore:

- Locate the stands on the *frame* of the vehicle.
- Raise vehicle just enough to relieve the pressure on the shocks and tires, taking care not to lift the tires off the ground. (Should this happen you should completely download the vehicle and move it forward and back, since not doing this causes added strain on the system again due to the "scissoring" of the front end assembly.)
- Add just a few extra pounds of air pressure to the tires to compensate for their being on the vehicle.

And finally thanks for all the good articles. They are unsurpassed in variety and interest. They have provided me with some powerful insights into drinking and driving, enough that I no longer drink — period.

AIC Enrique A. Gomez-Castano
Wurtsmith AFB MI 48753

Thanks for the tips.

☆U.S. GOVERNMENT PRINTING OFFICE: 1985— 583-035

SAFETY SCRAMBLE

by AW2 HART, VX-1
Naval Air Station
Patuxent River, Maryland

Unscramble the seven words to reveal the car parts (each letter of a word should fit in a box). Then unscramble the circled letters to solve the four-word safety phrase.

1. RSIET
2. NERDFE
3. AVELSV
4. TULUNG
5. TARETBY
6. ATRSRTE
7. GALTHEHSDI

ANSWERS ON PAGE 21